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Shinji Kajita

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EXAMINER

BLAN, NICOLE R

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/585,482	Applicant(s) KAJITA ET AL.	
	Examiner NICOLE BLAN	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,8,9,11,12,21,22,30,36 and 37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,8,9,11,12,21,22,30,36 and 37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The amendments to claims 1, 3, 8, 9, 11, 12, 21 and 30, the addition of claims 36 and 37, and the cancellation of claims 2, 4-7, 10, 13-20, 23-29 and 31-35 filed on October 3, 2008 have been acknowledged.

2. In view of the amendments to the abstract and claim 1 and the cancellation of claims 5 and 23, the objections to the specification as well as the rejection under 35 U.S.C. 112, second paragraph are withdrawn.

Response to Arguments

3. Applicant's arguments filed October 3, 2008 have been fully considered but they are not persuasive.

In response to applicant's argument regarding Verhaverbeke failing to teach the newly added limitation "...configured to increase or decrease a rotational speed of said substrate holding mechanisms so as to cause rotational slipping of the substrate relative to said substrate holding mechanism," the Examiner does not find this persuasive.

For claim 1, the limitation, "...said substrate rotation mechanism being configured to increase or decrease a rotational speed of said substrate holding mechanisms so as to cause rotational slipping of the substrate relative to said substrate holding mechanisms..." is intended use and therefore carries no patentable weight. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. It is fundamental that an apparatus claim defines the structure of the invention and not how the

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structure is used in a process, or what materials the structure houses in carrying out the process.

Ex parte Masham, 2 USPQ2d 1647, 1648 (BPAI 1987). See also *In re Yanush*, 477 F.2d 958, 959, 177 USPQ 705,706 (CCPA 1973); *In re Finsterwalder*, 436 F.2d 1028, 1032, 168 USPQ 530, 534 (CCPA 1971); *In re Casey*, 370 F.2d 576, 580, 152 USPQ 235,238 (CCPA 1967).

For claim 9, the limitation "... so as to cause rotational slipping of the substrate relative to the substrate holding mechanism", it is axiomatic that one who performs the steps of the known process must necessarily produce all of its advantages. Mere recitation of a newly discovered function or property, that is inherently possessed by things in the prior art does not cause a claim drawn to these things to distinguish over the prior art. *Leinoff v. Louis Milona & Sons, Inc.* 220 USPQ 848 (CAFC 1984). Therefore, since the processing steps of '475 are similar to those instantly claimed, the result of applying such steps, i.e. causing rotational slipping, is present within the teaching of '475.

4. Applicant's arguments, see pages 8-9, filed October 3, 2008, with respect to the rejection(s) of claim(s) 3, 30, 36 and 37 under 35 U.S.C. 103(a) have been fully considered and are persuasive in view of the amendments to the claims. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made. Please refer to the detailed discussion below.

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Claim Objections

5. Claim 36 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 36 contains an identical limitation that is already cited in parent claim 3.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1, 9, 11, 12 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verhaverbeke et al. (U.S. PGPub 2002/0066475, hereinafter '475).

Claim 1: '475 teaches a substrate holding mechanism (310) that includes a body having a projection for supporting the substrate (214) [page 2, paragraph 30] and a rotatable pawl having a

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presser to press the substrate from above (260) [page 2, paragraph 31] which holds the substrate under a force which changes with the change in the rotational speed of the substrate holding mechanism [page 3, paragraph 32]. The rotational speed of the substrate holding mechanism is changed by a motor attached to the chuck (122 and 148) [page 3, paragraph 36] while treatment liquid supply mechanism (122 and 124) supplies cleaning and treatment liquid (DI water) to the substrate [pages 2-3, paragraphs 25, 27 and 36]. '475 additionally teaches that the motor (122) which rotates the substrate holding mechanism relative to a rotation speed of the substrate [page 3, paragraph 36].

The limitation, "...said substrate rotation mechanism being configured to increase or decrease a rotational speed of said substrate holding mechanisms so as to cause rotational slipping of the substrate relative to said substrate holding mechanisms..." is intended use and therefore carries no patentable weight. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. It is fundamental that an apparatus claim defines the structure of the invention and not how the structure is used in a process, or what materials the structure houses in carrying out the process. *Ex parte Masham*, 2 USPQ2d 1647, 1648 (BPAI 1987). See also *In re Yanush*, 477 F.2d 958, 959, 177 USPQ 705,706 (CCPA 1973); *In re Finsterwalder*, 436 F.2d 1028, 1032, 168 USPQ 530, 534 (CCPA 1971); *In re Casey*, 370 F.2d 576, 580, 152 USPQ 235,238 (CCPA 1967).

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Claim 9: '475 teaches a substrate holding mechanism (310) that includes a body having a projection for supporting the substrate (214) [page 2, paragraph 30] and a rotatable pawl having a presser to press the substrate from above (260) [page 2, paragraph 31] which holds the substrate under a force which changes with the change in the rotational speed of the substrate holding mechanism [page 3, paragraph 32]. The rotational speed of the substrate holding mechanism is changed [reads on "increasing or decreasing a rotational speed"] by a motor attached to the chuck (122 and 148) [page 3, paragraph 36] while treatment liquid supply mechanism (122 and 124) supplies cleaning and treatment liquid (DI water) to the substrate [pages 2-3, paragraphs 25, 27 and 36]. '475 additionally teaches that the motor (122) which rotates the substrate holding mechanism relative to a rotation speed of the substrate [page 3, paragraph 36].

Regarding the limitation "... so as to cause rotational slipping of the substrate relative to the substrate holding mechanism", it is axiomatic that one who performs the steps of the known process must necessarily produce all of its advantages. Mere recitation of a newly discovered function or property, that is inherently possessed by things in the prior art does not cause a claim drawn to these things to distinguish over the prior art. *Leinoff v. Louis Milona & Sons, Inc.* 220 USPQ 848 (CAFC 1984). Therefore, since the processing steps of '475 are similar to those instantly claimed, the result of applying such steps, i.e. causing rotational slipping, is present within the teaching of '475.

Claims 11 and 12: '475 teaches the limitations of claim 9 above. '475 also teaches changing the rotational speed of the substrate from a first rotational speed (rpm=0 before the cleaning process commences) [pages 2-3, paragraph 31] then changing the rotational speed to a

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second speed (rpm=3000-6000) [page 3, paragraph 36] and returning to the first rotational speed (rpm=0 for removal of the wafer) [pages 2-3, paragraph 31]. The supply of treatment liquid is stopped after the rotational speed is increased from the first rotational speed (rpm=0) to the second rotational speed (rpm=300-6000) [page 2, paragraph 27].

Claim 21: '475 teaches the limitations of claim 9 above. '475 also teaches that the liquid is supplied to completely coat and clean the substrate [page 3, paragraph 37].

9. Claims 3, 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over '475 in view of Nguyen (U.S. PGPub 2005/0133075, hereinafter '075).

Claim 3: '475 teaches a substrate holding mechanism which holds the peripheral portion of the substrate (210) attached to a base member (148, 248). The base member faces one surface of the substrate (106). A rotatable shaft (242) attached to the central portion of the base member (248). The substrate processing apparatus has a first and second liquid supply nozzle (151 and 142 respectively) [page 3, paragraphs 37 and 38]. The first supply nozzle supplies a chemical liquid or a first cleaning liquid (123 and 124) [page 2, paragraph 25] and the second supply nozzle supplies a second cleaning liquid (112) to the inner surface of said substrate holding mechanism and upper surface of said base member [page 2, paragraph 24]. The apparatus also comprises of a gas supply nozzle [page 3, paragraph 39] which supplies gas between the substrate and said base member. '475 implicitly teaches a switching device during use of the RCA cleaning chemistry which switches the chemical liquid to the first cleaning liquid in the first nozzle [page 2, paragraph 27]. '475 does teach that the second nozzle and the gas supply

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nozzle is disposed within the rotatable shaft, but does not teach that the first liquid supply nozzle is within the rotatable shaft. Without evidence of unexpected results, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have the first liquid supply nozzle within the rotatable shaft, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. *Howard v. Detroit Stove Works*, 150 U.S. 164 (1893).

'475 does not teach that the first and second line have a mechanism for discharging and draining the liquid without supplying the liquid to the substrate. However, '075 shows a generic teaching of a non-dripping nozzle so that droplets do not fall onto a surface [title] and teaches attaching a pump to a line that is connected to the nozzle in order to drain the liquid from the nozzle so that liquid does not fall to the surface of the substrate and damage the substrate [Figs. 4d and 4e; page 1, paragraph 6; page 2, paragraphs 29-30]. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the apparatus of '075 in the apparatus of '475 with a reasonable expectation of success because '075 teaches incorporating a drain in the supply line to prevent liquid that is remaining in the nozzle from falling onto the substrate and damaging it.

Claim 36: '475 teaches the limitations of claim 3 above. '475 also teaches a gas supply nozzle which supplies gas between the substrate and said base member [page 3, paragraph 39].

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Claim 37: '475 teaches the limitations of claim 3 above. '475 also teaches a purge gas [N₂, page 3, paragraph 39] which supplies purge gas between said rotatable shaft and said nozzle structure.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over '475 in view of Rodney Chiu et al. (U.S. PGPub 2003/0183250, hereinafter '250).

Claim 8: '475 teaches the limitations of claim 1. '475 does not teach or suggest a scatter prevention cup disposed outside of said substrate holding mechanism and being movable in a vertical direction. However, '250 teaches a scatter prevention cup which translates in a vertical direction [Fig. 6 step 610; paragraph 37 and 59] to prevent fluid flow from scattering. All of the component parts are known in '475 and '250. The only difference is the combination of the "old elements" into a single device. Thus, without evidence of unexpected results it would have been obvious to one of ordinary skill in the art to have a scatter prevention cup as taught by '250 on the outside of the substrate holding mechanism of '475, since the operation of the scatter prevention cup is not dependent on the operation of the substrate holding mechanism to achieve the predictable result of preventing fluid from scattering on the interior of the apparatus.

11. Claim 22 rejected under 35 U.S.C. 103(a) as being unpatentable over '475 as applied to claim 21 above, in view of Yamamoto et al. (U.S. Patent 5,898,720, hereinafter '720).

Claim 22: '475 teaches the limitations of claim 21 above. It does not teach or suggest what the film comprises. The examiner takes official notice that copper is a common impurity in layers of semiconductors as evidenced by '720 [col. 6, lines 35-40]. Thus, without evidence of

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unexpected results, a person of ordinary skill in the art to try the method of processing the semiconductor as taught by '475 that has the impurities of '720, as a person with ordinary skill has good reason to pursue the known options within his or her technical grasp. In turn, because the processing method for removing impurities is predicted by prior art, it would have been obvious to use the method to process the substrate.

12. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over '475 and '075 as applied to claim 3 above, and further in view of '250.

Claim 30: '475 and '075 teach the limitations of claim 3. They do not teach or suggest a scatter prevention cup disposed outside of said substrate holding mechanism and being movable in a vertical direction. However, '250 teaches a scatter prevention cup which translates in a vertical direction [Fig. 6 step 610; paragraph 37 and 59] to prevent fluid flow from scattering. All of the component parts are known in '475 and '250. The only difference is the combination of the "old elements" into a single device. Thus, without evidence of unexpected results it would have been obvious to one of ordinary skill in the art to have a scatter prevention cup as taught by '250 on the outside of the substrate holding mechanism of '475, since the operation of the scatter prevention cup is not dependent on the operation of the substrate holding mechanism to achieve the predictable result of preventing fluid from scattering on the interior of the apparatus.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICOLE BLAN whose telephone number is (571)270-1838. The examiner can normally be reached on Monday - Thursday 8-5 and alternating Fridays 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. B./

Examiner, Art Unit 1792

/Alexander Markoff/

Primary Examiner, Art Unit 1792